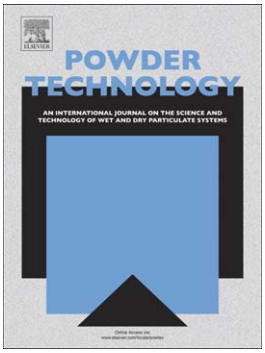

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Analytical Solution and heat transfer of two-phase nanofluid flow between Non-parallel walls considering Joule heating effect

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A B S T R A C T

In this paper, MHD nanofluid flow, heat and mass transfer between Non-parallel walls is investigated. Brownian diffusion and thermophoresis effects which are two momentous slip mechanisms in nanofluids have been considered in the nanofluid model. Also, Joule heating effect is taken into account. The governing radial momentum, energy and mass equations are solved by Duan–Rach Approach (*DRA*). This method allows us to find a solution without using numerical methods to evaluate the undetermined coefficients. This method modifies the standard Adomian Decomposition Method by evaluating the inverse operators at the boundary conditions directly. The effects of active parameters such as the Reynolds number, the opening angle parameter, the Schmidt number, Thermophoretic parameter and Brownian parameter are investigated on the velocity, temperature and concentration. Also, the value of the Nusselt number is calculated and presented through figures. The results indicate that the temperature and concentration profiles and Nusselt number increase with the increasing Schmidt number. In addition, the limiting cases are gained and found to be in an excellent agreement with the previous works.

Keywords: Nanofluid; Brownian motion; Thermophoresis; Non-parallel walls; Joule heating; Duan–Rach approach (*DRA*)

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